

## Field Observations of the Vulnerable Impressed Tortoise, *Manouria impressa*, from Southern Laos and Notes on Local Chelonian Trade

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**Abstract** Observations of wild chelonians in Indochina are uncommon with most records and specimens coming from the commercial wildlife trade. During the surveys of the Xe Sap National Protected Area in southern Laos between February and May 2012, four impressed tortoises, *Manouria impressa* (IUCN Red List: Vulnerable) were found in three separate field locations. There are few published observations of this species in the wild. We also present data on threats and local value of chelonians in the wildlife trade.

**Keywords** Xe Sap National Protected Area, Laos, *Manouria impressa*, wildlife trade

Impressed tortoises, *Manouria impressa*, are a poorly known, globally threatened (IUCN Red List: Vulnerable) terrestrial tortoise species. The species occurs in closed canopy forests, including those with extensive bamboo, in mountainous areas and has been recorded in the areas between approximately 600 and 1300 m above sea level (a.s.l.) in continental Southeast Asia with records from Burma, southern China, Thailand, Laos, Vietnam, Cambodia, and Peninsular Malaysia (Stuart, 1999; Bain and Hurley, 2011). However, there are very few published observations of *M. impressa* in the wild and most records, particularly in Indochina (*sensu* Laos, Vietnam, and Cambodia), are from individuals found in markets, seizures from traders, or empty shells in villages (Stuart and Platt, 2004). Within Laos, *M. impressa* has been recorded in the wild from the Nam Et National Protected Area, Phou Xang He National Protected Area, and Nakai-Nam Theun National Protected Area (Stuart, 1999; R. J. Tizard in litt., 2013). The species was also reported from

the Phou Khao Khoay National Protected Area. However, the person who reported this species made numerous elementary identification mistakes (J. W. Duckworth in litt., 2013) and the credibility of this record cannot now be assessed. Stuart and Platt (2004) listed additional specimen records of impressed tortoise from Laos.

Between February and May 2012 we undertook biodiversity surveys, focusing on the birds, large mammals, amphibians, reptiles, and flora in the Xe Sap National Protected Area (NPA), southern Laos. The Xe Sap NPA (Figure 1) is located in the Central Annamites, a globally important area for biodiversity supporting large numbers of endemic fauna and flora. The Xe Sap NPA covers approximately 1335 km<sup>2</sup> in two provinces of southern Laos (Salavan and Xekong) with altitude ranging between 400 and 2066 m a.s.l.

We observed *M. impressa* from three locations during the surveys in and around the Xe Sap NPA (Figure 1).

Location 1 (16°9'43.15" N, 106°48'37.80" E; Ta-Oy District, Salavan Province; 1290 m a.s.l.): One live adult male impressed tortoise was observed active at 15:30 h on 18 May 2012 (Figure 2). It was walking on the forest floor at a 40% slope.

Location 2 (16°5'5.83" N, 106°50'27.94" E; Ta-Oy

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**Figure 1** Location of impressed tortoise records (numbers of 1, 2, 3 show the locations mentioned in the text) within the Xe Sap NPA, outlined on map, Laos. Villages surrounding the protected area are shown by the circles with those mentioned in the text named.

District, Salavan Province; 1200 m a.s.l.): One dead adult impressed tortoise was found in a snare line on 21 May 2012. The animal had probably been dead for some time, probably at least several days, and might have lived for a while after being caught before eventually dying. Most snares in the line were inactive, and this and other signs suggested that it had probably not been checked for at least a month and was likely abandoned.

Location 3 (15°57'50.89" N, 107°20'41.86" E; Kaleum District, Xekong Province; 1200 m a.s.l.): Two live adults (male and female) were found hidden in a bag in a campsite recently used by hunters on 5 May 2012 (Figure 3). It appeared as though the hunters had gone further into the forest and were intending to pick up the tortoises on their return. This location was approximately 7 km south from the border of the Xe Sap NPA.

The forest in all three locations can broadly be described as hill evergreen forest; a relatively widespread forest type in the Xe Sap NPA above approximately 900 m a.s.l. Within the hill evergreen forest in western Xe Sap NPA the canopy is characterized, in many areas, by the conspicuous presence of emergents of the restricted range conifer *Pinus dalatensis* ca. 20–30 m in height with an additional two to three layers of canopy structure dominated by Fagaceae, Lauraceae, Myrtaceae, Theaceae and Magnoliaceae. In Location 2 the forest canopy was predominantly broadleaf with conspicuous absence of *P. dalatensis* and a relatively open forest floor. Location 3,

in Kaleum district, was clearly more mesic than Locations 1–2 with relatively few conifers of any species, but the forest there was not true wet evergreen forest.

Chelonians are highly threatened in Indochina largely due to hunting for trade. Informal interviews in ethnic Pakoh, Katoh and Ta-Oy villages around the Xe Sap NPA (Ahdengkotay, Aho, Adapadeu, Phoxen, Thongsa; all shown in Figure 1) suggested that trade in chelonians is a good source of income although turtles and tortoises are becoming rarer according to villagers. Ethnic village guides were very excited when we came across all the impressed tortoise specimens and were subsequently disappointed not to keep them. Chelonians, they explained, are an easy source of income.

Based on informal interviews with local villagers, live impressed tortoise can be sold for the equivalent of around 12.5 USD/kg to Vietnamese traders. However, an ethnic Chinese trader located in the district capital, Ta-Oy was reported by local villagers to be paying up to 25 USD/kg for the species. Adult impressed tortoises were reported to weigh occasionally in excess of 3 kg. A 2006 survey of chelonians in the Song Thanh Nature Reserve in Quang Nam Province, Vietnam (< 100 km southeast of the Xe Sap NPA) reported an average price of USD2.20/kg for impressed tortoise (McCormack *et al.*, 2006), suggesting a possible recent increase in value. The prices for *M. impressa* were higher than those quoted for trionychid softshell turtles of 7.5–11.25 USD/kg. However based on



**Figure 2** Impressed tortoise observed in the field in the Xe Sap NPA (Location 1).



**Figure 3** Two impressed tortoises found in camp close to the Xe Sap NPA (Location 3).

information from Ta-Oy district at least two other chelonian types, identified by the lead author based on discussions with villagers as big-headed turtle, *Platysternon megacephalum* (50 USD/kg) and box turtles, *Cuora* (100 USD/kg), were more valuable than *M. impressa*.

As illustrated by the impressed tortoise record from Location 2, terrestrial tortoises in the Xe Sap NPA can be captured in snare traps with drift fences, which are generally set by local people for mammals and terrestrial birds and often run for several hundred meters to more than one kilometer. However, the villagers from Axngo Village reported the preferred way of collecting chelonians is with trained hunting dogs as this usually guarantees a live specimen. Despite the clear threats to chelonians in the Xe Sap NPA, the large extent of hill evergreen forest in the protected area and the relatively low level of human activity suggest a potentially significant population of impressed tortoise. This is supported by the relative frequency of observations of

the species during our surveys. The authors combined previous fieldwork in Laos, which for Robert Timmins began in the early 1990s, produced only one field observation of impressed tortoise.

A number of other chelonian types were reported from the protected area and it is possible that the NPA may still harbor important populations of other montane chelonians (e.g., box turtle, *Cuora* and big-headed turtle, *P. megacephalum*). However, only one other chelonian was observed in the wild (most likely a species of *Cyclemys*). Whilst no targeted searches were conducted within villages, a small number of impressed tortoise shells were observed in Pale Village, Kaleum District. Whilst densities of all commercially valuable chelonians are surely depressed within the Xe Sap NPA, our observations of four individual impressed tortoises in field situations demonstrate that the species has not yet been extirpated in these areas of the Xe Sap NPA as it has likely been in more easily accessible areas elsewhere given the high hunting pressure in many protected area across Laos and the considerable regional chelonian trade. Strong law enforcement efforts and community engagement activities are essential for protecting all chelonians within the protected area. However, this recommendation applies almost without exception to the area's threatened wildlife; chelonians need not, therefore, be a separate focus of management.

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## References

- Bain R. H., Hurley M. M.** 2011. A biogeographic synthesis of the amphibians and reptiles of Indochina. *Bull Am Mus Nat Hist*, 360: 1–138
- McCormack T., Nguyen Xuan Thuan, Hendrie D. B.** 2006. Assessing the potential of a localised conservation initiative focused on the critically endangered Indochinese box turtle (*Cuora bourreti*). Asian Turtle Program, Hanoi, Vietnam
- Stuart B. L.** 1999. Amphibians and Reptiles. In Duckworth J. W.,

Salter R. E., Khounboline K., (Eds.), Wildlife in Lao PDR: 1999 status report. IUCN-Wildlife Conservation Society-Centre for Protected Areas and Watershed Management, Vientiane, Laos. 44–67

**Stuart B. L., Platt S. G.** 2004. Recent records of turtles and tortoises from Laos, Cambodia, and Vietnam. *Asiat Herpetol Res*, 10:129–150